National Transportation Safety Board

Flight Crew Performance

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Human Performance

Pilot Preparations for Landing

- Captain obtained airport weather
- Runway conditions “wet/good” on first 2/3 of runway
- Calculations indicated adequate runway length to stop safely
- Automatic speedbrakes armed and “MAX AUTO” wheel braking selected
- Pilots discussed need for prompt thrust reverser (TR) deployment

Pilot Duties after Landing

- Pilot flying (first officer)
  - Deploy TRs, apply manual brakes, and stow TRs as the airplane decelerates
- Pilot monitoring (captain)
  - Monitor speedbrake and TR deployment, make necessary callouts
- Captain manually deploy speedbrakes

Pilot Actions after Landing

- Less than 1 second after touchdown, first officer attempts TR deployment
- About 2.8 seconds after touchdown, the captain stated, “deployed,” followed by “two in reverse”
- About 0.5 seconds later, the first officer stated, “no reverse”

Speedbrake and TR Deployment

- Both systems were in transition
  - Initial speedbrake handle movement
  - TR amber annunciation lights
- Captain expected system to work
- Distraction caused by TRs not deploying

Pilot Monitoring Responsibilities

- Captain immediately took command of TRs
- Captain deviated from normal company procedures
- If captain adhered to monitoring duties, he likely would have recognized the speedbrakes had not deployed

Speedbrakes' Failure to Deploy

- Experienced pilots get distracted
- Company callouts are not failsafe
- Aural alert would be a recognizable and salient cue

TRs' Failure to Deploy

- Pilots needed to stow reverse thrust lever to redeploy TRs
- Pilots unaware of this procedure

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